throat slender-funnelform, 2 mm., teeth ovate, with slight vertical apical crest, 0.8 mm. long); achenes obovate, compressed, 5-nerved, hirsutulous chiefly above, 2–6 mm. long; pappus of about 30 white subequal hispidulous bristles 3–8 mm. long; style tips deltoid, acutish.

WASHINGTON: In open sphagnum bog near Lake Quinault, Grays Harbor Co., 10 July 1931, *J. William Thompson* 7336 (TYPE no. 1,531,366, U. S. Nat. Herb.). Duplicates of the type collection were distributed to Kew, Missouri Bot. Gard.; Phila. Acad. Sci.; Gray, Stanford, and Univ. of Calif. herbaria.

This plant is a member of the group of *Erigeron salsuginosus* (Richards.) Gray, in which the species were inexcusably multiplied by Dr. Greene. Its nearest relative, probably, is *Erigeron Aliceae* Howell (with which *E. amplifolius* Howell is synonymous), in which the rays are colored and the involucre finely glandular as well as more or less densely villous, especially toward the base.

This sphagnum bog was one of a series once completely surrounded with a dense growth of timber which has been logged-off. The Erigeron was associated with *Aira cespitosa* L., *Comarum palustre* L., *Myrica Gale* L., *Caltha biflora* DC., *Kalmia polifolia* Wang., and a tall white *Anemone* of the *quinquefolia* group.

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# A NEW CYPRIPEDIUM HYBRID

J. T. CURTIS

NEAR Eagle Lake, Waukesha County, Wisconsin, is a station rich in Lady Slippers. Here may be found *Cypripedium parviflorum*, *C. parviflorum* var. *pubescens*, *C. candidum* and *C. reginae*, all within the limits of a few acres. The locality was visited in the spring of 1931 by C. P. Gale and the writer. Near a large colony of *C. parviflorum* var. *pubescens* a plant was found that appeared to be intermediate in size and shape between that variety and *C. candidum*. The lip, although white, had the dimensions of a Large Yellow Lady Slipper. The only explanation seemed to be hybridization, but since we were in doubt as to the possibility of such an occurrence, we removed a portion of the plant to our garden for further study. This year the plant bloomed with the same peculiar characteristics above mentioned.

The original plant was growing in the transitional zone between a meadow and a gravel knoll. The meadow is underlain with marl, and

has an alkaline reaction (pH 7.5) while the side of the hill is distinctly acid (pH 6). Growing on the slope amongst *Corylus americana*, *Polemonium reptans*, and *Pteris aquilina* were about fifty plants of *C. parviflorum* var. *pubescens*. Not more than fifteen rods away, *C. parviflorum* and *C. candidum* were growing in abundance. In the latter group, three or four plants of *C. Andrewsii* were found. Associated with them were *Castilleja coccinea*, *Hypoxis hirsuta*, *Polygala Senega*, and *Phlox pilosa*.

Mr. A. M. Fuller's recent article[1] on the cross between *C. candidum* and *C. parviflorum* (*C. Andrewsii*) has settled the question as to the possibility of a native cypripedium hybrid. All conditions necessary for hybridization—proximity, structural resemblances, and coincidence of flowering time—were favorable in the present case. There was always the chance that the large size of the flower might be merely the result of a happy combination of chromosomes. However, a study of the measurements of typical plants of all species concerned has convinced us that the cross is with var. *pubescens* and not with *C. parviflorum*. A glance at the table will show that the hybrid is greater in every dimension than *C. parviflorum*. The clinching argument came with the discovery of another specimen from a station lacking in *C. parviflorum*. It was found by Mr. S. W. Faville, of Lake Mills, on a low rise in a prairie near the Crawfish River, Jefferson County, Wisconsin. *C. candidum* and *C. parviflorum* var. *pubescens* grew by the hundreds there, but *C. parviflorum* was totally absent. This plant, which has been growing in Mr. Faville's garden for two years, was mentioned in Mr. Fuller's article as being *C. Andrewsii*, but more detailed observation this year has shown it to be similar to the hybrid from Eagle Lake. At the time of the visit to the station last year, only a few *C. parviflorum* var. *pubescens* were in bloom and they were taken by Mr. S. C. Wadmond, of Delavan, to be *C. parviflorum*. However, both he and Mr. Fuller recognized the plants in our garden this year to be the same as those at Lake Mills. On June 6, 1932, another plant was located at a station near Swan Lake, Columbia County, Wisconsin. Again conditions were perfect, with *C. candidum* and *C. parviflorum* var. *pubescens* growing within short distances. We returned to the original station at Eagle Lake on June 3, 1932, when we found a plant with one flower. This flower was taken for the type specimen.

[1] Fuller, A. M., "A Natural Cypripedium Hybrid from Wisconsin," Rhodora, Vol. 34, June, 1932, p. 97.

One of the outstanding characteristics of the hybrid is the change in color of the lip from a bright yellow in the bud to a pure white in the mature flower. The lip still retains the color of the bud at anthesis. On the second day, the yellow begins to give place to a deep cream. This change continues until only a slight tinge of cream is present at the end of the lip.

The measurements in the following descriptions and table are from large numbers of both fresh flowers and herbarium specimens. Measurements of sepals, petals, and staminodes were a trifle greater from living flowers, but the lip lengths were greater on pressed specimens. Length of petal is the most variable of all characters, whereas length of lip remains so nearly constant as to be a rather positive identification mark for each species.

*C. parviflorum* in this region has the following characteristics: plants 1–2 flowered; sepals and petals madder-purple; lip yellow, 21–26 mm. long, striped inside with madder-purple; staminodium triangular, orange-yellow, 5 mm. wide, 8 mm. long; stigma elliptical, 3.5 mm. wide, 4.5 mm. long; seeds .85–.95 mm. long, with .91 mm. as the average.

*C. parviflorum* is found typically in tamarack bogs, but often reaches greatest numbers in the sunny meadows where tamaracks have once stood.

*C. parviflorum* var. *pubescens* in Wisconsin is very distinct from the type *C. parviflorum*. It possesses these characteristics: plants 2–7 dm. high, 1–2 flowered; sepals and petals yellow-green, sepals ovate, 38–60 mm. long, 13–25 mm. wide; petals linear, 55–72 mm. long; lip golden-yellow, 34–50 mm. long, 20–27 mm. wide, striped inside with maroon; staminodium triangular, bright yellow, 11–14 mm. long, 6–10 mm. wide; stigma ovate, 6 mm. wide, 8 mm. long; seeds 1.1–1.43 mm. long, average 1.27 mm.

*C. parviflorum* var. *pubescens* is typically an upland woods plant, loving an acid soil (pH 6–6.5). It is often found in hazelnut thickets bordering on meadows. Being a hardy plant, it sometimes outlives these protecting thickets. Most cases of *C. parviflorum* var. *pubescens* growing in open meadows may be thus accounted for. The extremely large specimens of *C. parviflorum* that are occasionally found are, in all probability, crosses between the type and the variety. As the table shows, the differences between *C. parviflorum* and *pubescens* are so great as to be almost specific. Color differences are also very

noticeable, the petals and sepals of *C. parviflorum* being always suffused with madder-purple, while the same parts in var. *pubescens* are yellow-green with brown spots and stripes.

In Wisconsin, *C. candidum* has these characteristics: plants one-flowered; sepals and petals greenish-yellow, striped with lines of brown or madder-purple; lip white, 18–25 mm. long, striped inside with magenta lines; staminodium yellow, oblong-linear, 4 mm. wide, 8 mm. long, spotted with maroon; stigma roundish, 3.5 mm. wide, 4 mm. long; seeds .6–.9 mm. long.

*C. candidum* grows in meadows or moist prairies where the soil reaction is neutral to alkaline (pH 7–8).

Mr. Fuller's description of *C. Andrewsii* gives the following characteristics: "Plants 16–40 cm. tall, 1–2 flowered; leaves oval-lanceolate, acute; sepals and petals greenish, much suffused with madder-purple; sepals ovate-lanceolate, 25–37 mm. long; petals lanceolate, 30–40 mm. long; lip 20–25 mm. long, white to cream-colored, conspicuously striped on the interior with violet; staminodium orange-yellow, triangular to semi-triangular, 4 mm. wide and 9 mm. long, marked in the apical region with spots and blotches of purple-brown; stigma roundish."

The new hybrid is called *C. Favillianum* since Mr. S. W. Faville, a long time lover of orchids, was the first to find it and also one of the first to realize that it was a hybrid.

× **Cypripedium Favillianum**, hyb. nov. (*C. candidum* × *C. parviflorum* var. *pubescens*). Planta 28–40 cm. alta, 1-flora; foliis ovato-lanceolatis, acutis; sepalis petalisque subviridibus, fusco-striatis; sepalis ovatis, 26–40 mm. longis; petalis lanceolatis, 37–48 mm. longis; labello 27–34 mm. longo, 16–20 mm. lato, albo postquam maturitatem, intus violaceo-striato; staminodio flavo, triangulare vel oblongo-lineare, 5–7 mm. lato, 9–11 mm. longo, apice fuscopurpureo-maculato; stigmate elliptico, 4.5–6 mm. lato, 5–7 mm. longo; seminibus .95–1.2 mm. longis, peraeque 1.08 mm.

× *Cypripedium Favillianum*, hyb. nov. (*C. candidum* × *C. parviflorum* var. *pubescens*). Plants 28–40 cm. tall, 1-flowered; leaves ovate-lanceolate, acute; sepals and petals yellowish-green, striped with brown; sepals ovate, acute, 26–40 mm. long, 11–20 mm. wide; petals lanceolate, 37–48 mm. long; lip 27–34 mm. long, 16–20 mm. wide, white when mature, striped inside and spotted around orifice with magenta-violet; staminodium yellow, triangular to oblong-linear, 5–7 mm. wide, 9–11 mm. long, spotted at apex with maroon, stalk 4–5 mm. long; stigma elliptical, 4.5–6 mm. wide, 5–7 mm. long; seeds .95–1.2 mm. long, average 1.08 mm. The TYPE specimen is in

the Carroll College herbarium, Cat. No. 1005, June 3, 1932, Eagle Lake, Waukesha County, Wisconsin. A co-type specimen and an autochrome photograph by Mr. G. L. Waite have been deposited in the Gray Herbarium.

CYPRIPEDIUM MEASUREMENTS

| | *C. parviflorum* Average of 23 specimens | var. *pubescens* Average of 42 specimens | *C. candidum* Average of 18 specimens | *C. Favillianum* Average of 14 specimens | *C. Andrewsii* Average of 9 specimens |
|---|---|---|---|---|---|
| Sepal | | | | | |
| Length | 30.5 mm. | 47.5 mm. | 27.5 mm. | 33 mm. | 31.5 mm. |
| Width | 13 mm. | 19 mm. | 9.5 mm. | 15.5 mm. | 11.5 mm. |
| Petal | | | | | |
| Length | 38.5 mm. | 63.5 mm. | 33 mm. | 41 mm. | 34 mm. |
| Width | 4.5 mm. | 6.5 mm. | 3.5 mm. | 5 mm. | 4 mm. |
| Lip | | | | | |
| Length | 23 mm. | 42.5 mm. | 21.5 mm. | 30 mm. | 21.5 mm. |
| Width | 13.5 mm. | 23.5 mm. | 13 mm. | 17.5 mm. | 12.5 mm. |
| Depth | 14 mm. | 27 mm. | 12.5 mm. | 18 mm. | 13 mm. |
| Staminodium | | | | | |
| Length | 8 mm. | 12.5 mm. | 8 mm. | 10 mm. | 7.5 mm. |
| Width | 4.5 mm. | 8.5 mm. | 4 mm. | 5.5 mm. | 4 mm. |
| Stigma | | | | | |
| Length | 4.5 mm. | 7.5 mm. | 3.6 mm. | 5.5 mm. | 4.5 mm. |
| Width | 3.5 mm. | 5.5 mm. | 3.4 mm. | 5 mm. | 3 mm. |
| Seeds | | | | | |
| Length | .91 mm. | 1.27 mm. | .8 mm. | 1.1 mm. | — |

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CARROLL COLLEGE,
WAUKESHA, WISCONSIN.

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RYDBERG'S FLORA OF THE PRAIRIES AND PLAINS.[1] During his later years Rydberg was working upon a handbook to cover the flora of the Great Plains region of North America and at his lamentable death he left the manuscript so nearly complete that, under the direction of Dr. Marshall A. Howe and with the assistance of other friends, it has now been issued. The book, a volume of more than 900 pages, with 600 text-figures, is neatly and compactly constructed and attractive in appearance. For the first time in one of Rydberg's major publications the International Rules of Nomenclature are followed (with very minor and unintentional infractions) and it is a joy to see maintained such familiar names as *Setaria*, *Glyceria*, *Luzula*, *Maianthemum*, *Carya*, *Barbarea*, *Oxytropis* and scores of other generic names which were long discarded by Rydberg.

The Great Plains and the Prairies or Prairie Plains of central North

[1] FLORA OF THE PRAIRIES AND PLAINS OF CENTRAL NORTH AMERICA. By Per Axel Rydberg. New York Botanical Garden, 1932. $5.50, *postpaid*.